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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/918,508	08/01/2001	Tatsuo Kakimoto	Q65478	3296

7590 07/14/2005

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EXAMINER	
LEE, BETTY L	
ART UNIT	**PAPER NUMBER**
1647	

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/918,508	KAKIMOTO ET AL.	
	Examiner	Art Unit	
	Betty Lee, Ph.D.	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,20,21 and 28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,20,21 and 28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 10/05/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

S.o.d

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/05/2005 has been entered.

Claims 1-8, 20, 21 and 28 are pending and under consideration.

Claim Rejections Withdrawn

2. The declaration filed on 04/15/2005 under 37 CFR 1.131 is sufficient to overcome the Benfey *et al* (PGPub 20020173017) reference.

The rejection for claims 1-7 and 20-21 under 35 U.S.C. 112, first paragraph, for lack of enablement, is withdrawn in response to applicants' amendments.

Claim Rejections Maintained

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 8 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The rejection of amended claim 8 under 35 U.S.C. 112, first paragraph, for lack of enablement, is maintained for reasons of record on pgs 4-5 of paper no. 1203. The applicants state on pg 9 of the response filed 4/5/2005, that "'with respect to cytokinin receptors having a plurality of amino acids deleted, substituted or added, these are defined in the amended claims as being encoded by a polynucleotide that hybridizes under stringent conditions to SEQ ID NO: 1, 3 or 5. Methods for obtaining a polynucleotide encoding such a cytokinin receptor are disclosed in the specification from page 15, line 17 to page 17, line 15". While the applicants' arguments are persuasive with respect to parts (a-h) of claim 8, they are not persuasive to part (i) of claim 8. The phrase 'deletion, substitution, or addition of one or a plurality of amino acids' may significantly change the function of the cytokinin receptor. Deletion, substitution or addition of any number of amino acids may completely eliminate its histidine kinase activity or introduce unknown function(s) to the cytokinin receptor. Therefore, the rejection of claim 8 is maintained.

Claim Rejections- new, necessitated by amendments

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-8, 20,21 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 20 in steps 2 & 3 state that measuring an 'existence' thereby determining a 'level' of signal transduction. Measuring an 'existence' will not determine a 'level' of signal transduction. Therefore, the claims are indefinite for lacking method steps.

Claim 20 is incomplete because the preamble says 'detecting agonist activity' but the claim never achieves the goal of 'detecting' activity.

Claims 8 and 28 are indefinite because the metes and bounds of what will hybridize, depend on time and temperature of hybridization, and more importantly on the washing conditions used (e.g. buffer, time and temperature).

Claim 8 is indefinite at part (d) because it is not clear what is intended by "a partially transmembrane region-deleted type cytokinin receptor". Claim 8 is further indefinite at part (h), as it is not clear what is present to constitute " a chimera-type cytokinin receptor", other than the sole recited element, "heterogeneous receiver regions". Further, it is not clear what comprises a heterogeneous receiver region for a histidine kinase. Accordingly, the metes and bounds of the claim cannot be determined.

Finally, claim 8 is indefinite at part (i), as it depends from parts (d) and (h). Since no sequence is specified in parts (d) and (h), the person of ordinary skill in the art

Would not be able to determine whether a protein comprised changes in the sequence, or was encoded by a nucleic acid meeting the limitations therein.

The term "lowered" in claims 3 and 4 is a relative term, which renders the claim indefinite. The term "lowered" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The applicants state 'lowered' intrinsic histidine kinase activity is indefinite because there is no frame of reference, such as compared to what 'normal' levels.

The remaining claims are rejected for depending from an indefinite claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kakimoto, T. *Science* 274:982-985, 1996. The reference teaches the cloning of a cytokinin receptor gene into wild type calli and screening assays for cytokinin activity (Fig 1 and 3). This reference teaches the *CKI1* gene is a histidine kinase homolog implicated in cytokinin signal transduction. Overexpression of *CKI1* gene in plants "results in characteristic effects of cytokinin action, although its role in 'cyokinin signal transduction is not clear', pg 985. The author teaches the screening for cytokinin-independent mutants and the transformation with cDNA of the *CKI1* gene into wild-type calli by *Agrobacterium*-mediated transformation (Fig 3, pg 983). Claims 1 and 2 are general method claims where the procedure as described is disclosed by the reference

which states that "transformed calli were screened for growth in the absence of exogenous cytokinin", pg 983.

The limitation of claim 20 which states 'in the presence of another substance' is met by the reference which teaches the use of auxin as a plant hormone in addition to cytokinin to test for cytokinin receptor responses of transformed cells. The use of auxin in the reference is equivalent to claim 21 which states that 'a substance having no agonist-activity' and therefore anticipates claim 21.

Claims 1-8,20,21 and 28 are rejected under 35 U.S.C. 102(a) as being anticipated by Inoue, T. *et al Nature*, 409:1060-1063, 2001. The reference teaches the testing of transformed cells for cytokinin responses by adding test substances (agonists) including cytokinin, trans-zeatin, isopentenyl-adenine, benzyl adenine and thidiazuron and other substances (antagonists) including auxins, abscisic acid and ethylene (pg 1060). It also teaches the assays for measuring responses, namely, callus growth (Fig 1), root growth (Fig 2) and complementation assays (Fig 3). It therefore anticipates claims 1, 2, 20 and 21.

Inoue, *et al* teaches the isolation of a cre1-1 mutant cell that has a decreased response to exogenous cytokinin and auxin, implying a 'lowered instrinsic histidine kinase activity' or lack of one type of cytokinin receptor, pg 1061. Claims 3-5 states that a host cell with 'lowered histidine kinase activity', 'defect in one or more histidine kinase genes' and 'no cytokinin receptor', respectively, are anticipated by this reference. Furthermore, this reference teaches the cloning of '*CRE1* gene in a yeast strain deficient in the *SLN1* gene, which encodes an osmosensing histidine kinase' (pg 1061).

It therefore anticipates claims 6 and 7 which states 'wherein transformed cell is yeast' and 'budding yeast' respectively.

Claims 8 and 28 are anticipated by this reference because SEQ ID No. 6 (aa sequence) and SEQ ID No. 5 (DNA sequence) corresponds to the CRE1 protein and gene, respectively.

Claim 20 is anticipated by this reference because the claim refers to measuring an 'existence or quantity of intracellular signal transduction from said cytokinin receptor in absence of said examinee substance but in the presence of another substance' while Inoue, *et al,* teaches the testing of *cre* mutants in the presence and absence of plant hormones that includes agonists and antagonists to the cytokinin receptor.

Claim 21 refers to 'a substance having no agonist-activity' is anticipated by the reference because it teaches the use of other plant hormones including abscisic acid (ABA) and 1-aminocyclopropane-1-carboxylic acid (ACC) that has no agonist activity to cytokinin receptor (Fig 2, pg 1061).

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Alexandrov, N. *et al* in 2000 EP1033405-A2 teaches the identification of an *Arabidopsis thaliana* protein fragment SEQ ID No. 59313 that has a 100% homology to amino acid sequence of SEQ ID 2. It does not teach that the sequence is a cytokinin receptor.

Frommer, W. in 2001, US Patent 6245970, teaches cloning of *Arabidopsis thaliana* cDNA into two yeast strains, column 14, lines 19-36. Frommer teaches the

cloning of the amino acid transporter for membrane transport but does not teach the cloning of the cytokinin receptor in yeast.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betty Lee, Ph.D. whose telephone number is (571) 272-8152. The examiner can normally be reached on M-F 9 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brenda Brumback can be reached on (571) 272-0961. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BLL

LORRAINE SPECTOR
PRIMARY EXAMINER